

PEER REVIEW HISTORY

BMJ Paediatrics Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Impact of lockdown and school closure on children's health and well-being during the first wave of COVID-19: a narrative review
AUTHORS	Rajmil, Luis Hjern, Anders Boran, Perran Gunnlaugsson, Geir Kraus de Camargo, Olaf Raman, Shanti

VERSION 1 – REVIEW

REVIEWER	Reviewer name: Amy van Grieken Institution and Country: Erasmus Universiteit Rotterdam, United Kingdom of Great Britain and Northern Ireland Competing interests: None
REVIEW RETURNED	23-Feb-2021

GENERAL COMMENTS	<p>This review describes an overview of the literature concerning the impact of school closure on children's health and well-being. The literature was searched until November 2020 and studies performed in countries across the world were included. Overall results of the studies showed an impact of school closure on various domains of child health and well-being. The study is relevant and timely. In general the paper provides complete overview of the literature published. A strength of the review is the broad range of papers included, with different durations and severity of lockdowns and as well as a broad range of child health outcomes. To further strengthen this point 1) the paper could benefit from a clear description of the main measures studied. This can be done by consistent terminology and the adding of information at some points in the text. And 2) some aspects might be elaborated upon more in the discussion to get some in depth interpretation.</p> <p>General: Use of decimal point "1.5" versus "1·5". Please add the full name to the abbreviations for example as footnote to the tables. Typo mistake in the table, e.g., "Appropriate".</p> <p>Abstract The aims of the review are two-fold; however, in the abstract, aim 2 "to what extent do these effects of confinement increase social inequalities in child health" seem to be missing?</p> <p>Introduction Page 2 line 21-27: Not clear what the main point of this paragraph is? Some details might help. For example the statement "for some children the impact will be lifelong", what is meant here? Is access vs no access meant in a broader sense? You can have access but live in a crowded home not being able to concentrate on virtual lessons? "Moreover, schools have an influence on every student's health, and have opportunities to advocate for implementation of reforms and innovations in school systems to promote the health of all students, and the linkage between health and education." This</p>
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	<p>sentence is not clear. Suggest rewrite this paragraph to convey main point. Line 22: twice 'further'.</p> <p>Page 2, line 37 and line 38: children were put at risk/ the risks are greater. Do the authors mean because of the inability to go to school? What are the risks being referred to.</p> <p>Page 2, line 43: is- important.</p> <p>Page 2 line 44: suggest to use 'given' instead of 'and the measures...'",</p> <p>Page 2, line 45: the aim states lockdown measures, but the question uses the wording large scale lockdown, is the focus only on large scale lockdowns and school closure? Suggest to give a clear 'definition' or description on what kind of situation is evaluated. It would help if consistent terms are used throughout the manuscript. How is lockdown defined, what is included in this review.</p> <p>Methods.</p> <p>A rapid systematic review is used. Can the authors clarify what is meant with this type of review and/or provide a reference to the methodology they applied as 'rapid review'.</p> <p>Page 3 line 10: which items cq which characteristics? Briefly describe.</p> <p>Page 3 line 18: "related to the measures adopted regarding of COVID-19". Was there a selection based on level of lockdown or were all studies included? What is the definition of lockdown used? I see at line 40 there is a specification on severity and time. Maybe it can be clear from the aims that all levels of lockdown are included. How is severity determined?</p> <p>What is the difference in 'school closure and lockdown'? Or is there no difference.</p> <p>Results:</p> <p>Page 4 line 12; is lockdown= confinement at home?</p> <p>Page 4, line 13: "was further stratified as low, intermediate or high risk", based on? A score or something else? Could you please indicate the criteria used?</p> <p>Page 4: if possible a paragraph on the second research question? Social inequalities</p> <p>The review included several studies on type 1 diabetes and these studies were grouped under the group "health service assess/use". Could this be a separate group (e.g., "chronic conditions") rather than care use?</p> <p>Discussion:</p> <p>Page 5 line 47: "lockdown or confinement and closure". See previous comments on de description of included situations.</p> <p>Page 5 paragraph 2: can anything be said about 1) lockdown severity or 2) differences between countries in regard to the effects on well-being observed?</p> <p>Page 5 Line 49: "Confinement has produced an increase in previously existing inequalities with respect to access to basic living conditions and care services, with more difficulties in households with fewer resources." Is there a reference fort his statement?</p> <p>Page 6, line 26 and onwards: time periods of lockdown/ closure were different, can any remark/ discussion be made on this aspect? It is not in results nor discussion, at limitations it states that lockdown duration as well as study duration differed, in general terms.</p> <p>Around 75% of the studies on mental health and 100% of the studies on physical activities were carried out among adolescents. The effects of lockdown might vary by child age. Can some discussion be added with regard to the findings across ages?</p>
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REVIEWER	<p>Reviewer name: Dr. Ansie Fouche</p> <p>Institution and Country: North West Univ, Social work, South Africa</p>
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	Competing interests: None
REVIEW RETURNED	09-Feb-2021

GENERAL COMMENTS	<p>Thank you for the opportunity to review your manuscript. Due to word limits for manuscripts that are set by journals it is not always possible to explain all the hard and great work that we have done. We however have a responsibility to the readers to also explain our methodology comprehensively. This is such an important study with thought-provoking findings. Most of my comments are related to the methods section. I think it needs more detail explanations of the how and what of the review. See my comments below.</p> <p>-Abstract refers to a "systematic review" but in the title in and in the manuscript a "rapid review" is mentioned.</p> <p>-Inclusion criteria - You state that there were "no language restrictions". Please explain this more - be specific in terms of the languages that you included in your searching strategy, who conducted those searches, what are their language competencies etc. Did you make use of translators, how did you check for accuracy etc. Did you take into consideration difference in words/meanings/cultural context when you conducted the searches.</p> <p>-Risk of bias: Please motivate why you used the Mixed Method Appraisal Tool when you analysed findings emanating from quantitative data. For example - Joanna Briggs have useful tools that allow for appraisal of various quantitative research designs.</p> <p>-Procedures: Please provide examples of the differences of opinion that occurred when decisions were made regarding included studies.</p> <p>-Data extraction: More detail is needed to help the reader understand how you extracted data. As it is, you have only included the items that were included in the data extraction form.</p> <p>-There is no reference to the data extraction form, who extracted the data, who checked for accuracy etc. Due to the no language bias, consider including the languages of the included article.</p> <p>-Analysis: Please explain how the descriptive and narrative analysis were performed. Did you follow a specific author in this regard? Please provide a brief step by step description to enlighten the readers. How many authors were involved, what measures did you use to ensure that the data analysis was trustworthy.</p> <p>-Results: Identify the specific designs eg. cross sectional survey (n=x); cohort study (n=x) etc. and countries UK (n=x); Australia (n= x) etc.</p> <p>Use this info to ask the "so what question?"</p> <p>-Were there any contextual, cultural or political factors that, if it would have been taken into consideration during the synthesis, it might have influenced the analysis?</p>
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VERSION 1 – AUTHOR RESPONSE

The authors would like to thank the reviewer for the helpful comments, which contribute to improve the quality of the manuscript.

Reviewer: 1

Comments to the Author

Thank you for the opportunity to review your manuscript. Due to word limits for manuscripts that are set by journals it is not always possible to explain all the hard and great work that we have done. We however have a responsibility to the readers to also explain our methodology comprehensively. This is such an important study with thought-provoking findings. Most of my comments are related to the methods section. I think it needs more detail explanations of the how and what of the review. See my comments below.

-Abstract refers to a "systematic review" but in the title in and in the manuscript a "rapid review" is mentioned.

Re: In accordance with this comment and those of the Associate Editor and the Editor-in-Chief, the terminology used has been revised. Thus, the title of the revised version is: *"Impact of lockdown and school closure on children's health and well-being during the first wave of COVID-19: a rapid narrative review"*. The term "rapid review" has been excluded in the revised version of the manuscript. Please, see also the answers to the Associate Editor and the Editor-in-Chief.

-Inclusion criteria - You state that there were "no language restrictions". Please explain this more - be specific in terms of the languages that you included in your searching strategy, who conducted those searches, what are their language competencies etc. Did you make use of translators, how did you check for accuracy etc. Did you take into consideration difference in words/meanings/cultural context when you conducted the searches.

Re: In the revised version we have specified in the search criteria that the work team was able to analyze studies published in Catalan, Danish, English, French, German, Icelandic, Italian, Norwegian, Portuguese, Spanish, Swedish, and Turkish. Accordingly, we have modified the methods in the revised version of the manuscript (see page 5, para 5):

"All quantitative studies ~~from~~ⁱⁿ peer review **literature** describing studies that ~~include~~^{provided} primary data about child (0-18 years) health and well-being, related to the measures **of school closure and any level of lockdown** adopted regarding COVID-19 ~~in children younger than 19y~~ were included. ~~without language restrictions.~~ **Articles in Catalan, Danish, English, French, German, Icelandic, Italian, Norwegian, Portuguese, Spanish, Swedish and Turkish" were included in the first screening. Following the initial screening, all included articles in the study were published in English language journals."**

-Risk of bias: Please motivate why you used the Mixed Method Appraisal Tool when you analysed findings emanating from quantitative data. For example - Joanna Briggs have useful tools that allow for appraisal of various quantitative research designs.

Re: After reviewing the different instruments for assessing risk of bias, we decided to use the MMAT due to its application for the type of studies included in this review, simplicity and ease of application, and familiarity of the research team with this method.

-Procedures: Please provide examples of the differences of opinion that occurred when decisions were made regarding included studies.

Re: A sentence has been modified by adding a specific example on the inclusion/exclusion criteria procedure (see page 5, 2nd to the last paragraph in the revised version):

*"Abstracts obtained Full text papers of the studies ~~was~~ **were** obtained in doubtful cases and independently ~~assessed~~ **evaluated** by these authors. Differences of opinion on inclusion/exclusion criteria was decided by discussion and consensus among all authors (i.e., one study that was initially included in the first screening was excluded by agreement of the authors due to a high risk of bias associated to the type of study and data collection; see the Supplementary material)."*

-Data extraction: More detail is needed to help the reader understand how you extracted data. As it is, you have only included the items that were included in the data extraction form.

-There is no reference to the data extraction form, who extracted the data, who checked for accuracy etc. Due to the no language bias, consider including the languages of the included article.

Re: Each included study was reviewed by a pair of authors (LR, AH and PB participated at this stage), and then LR led the data extraction and it was checked by the rest of authors. The tables provided (see tables 1 to 5 in the revised version) give a 'summary of findings' to answer the research questions, including characteristics of the included studies. A sentence has been added to the "data extraction methods" trying to clarify these procedure (see page 5, last paragraph in the revised version):

"Data extraction: LR led data extraction that was checked initially by AH and PB, followed by a consensus with the rest of the authors. Data extraction included a summary of findings to answer the research questions and characteristics of the included studies: Author; setting (country: international, national or regional study); type of study; age(s); lockdown (~~severity and~~ time in days/months); school closure and lockdown (time period); type of outcome; impact on child health, and social inequalities."

-Analysis: Please explain how the descriptive and narrative analysis were performed. Did you follow a specific author in this regard? Please provide a brief step by step description to enlighten the readers. How many authors were involved, what measures did you use to ensure that the data analysis was trustworthy.

Re: Given the characteristics of the quantitative studies included in our analysis, steps of data analysis and interpretation of results can be summarized as identification of thematic content, summary of quantitative results and analysis of the strengths and limitations of each study. In line with the Reviewer's proposal, a sentence has been added to the data analysis section (see page 6, paragraph 2):

*"Analysis: A meta-analysis was not ~~be~~possible to carry out given the nature of the study design and heterogeneity of the findings. **Consequently, a** descriptive and narrative synthesis*

of the results was carried out. **First, studies were grouped according to their main subject and methodological similarities. LR, AH, and PB, carried out the identification of the thematic content and described the results, followed by discussion among all the authors. The results were then analyzed and summarized to distill out findings to subsequently integrate those with the rest of studies."**

-Results: Identify the specific designs eg. cross sectional survey (n=x); cohort study (n=x) etc. and countries UK (n=x); Australia (n= x) etc.

Re: According to a proposal from the Editor in Chief, the revised version of the manuscript includes Tables 1 to 5 regarding each thematic group. Each study includes the study design, country, etc. (see Table 1 to 5 in the revised version)

Use this info to ask the "so what question?"

-Were there any contextual, cultural or political factors that, if it would have been taken into consideration during the synthesis, it might have influenced the analysis?

Re: The authors consider that all research analysis is based on theoretical assumptions. In our case the research team considered that social determinants of child health play an important role, as well as the specific political and economic conditions in each country/region. In addition, other factors may have influenced the analysis (including geographical origin and socio-cultural and political context of the authors themselves). In the present case we believe that one of the strengths of the study resides in the great diversity of origin of the authors themselves and therefore the different experiences associated with the pandemic.

Reviewer: 2

Comments to the Author

This review describes an overview of the literature concerning the impact of school closure on children's health and well-being. The literature was searched until November 2020 and studies performed in countries across the world were included. Overall results of the studies showed an impact of school closure on various domains of child health and well-being. The study is relevant and timely.

In general the paper provides complete overview of the literature published. A strength of the review is the broad range of papers included, with different durations and severity of lockdowns and as well as a broad range of child health outcomes. To further strengthen this point 1) the paper could benefit from a clear description of the main measures studied. This can be done by consistent terminology and the adding of information at some points in the text. And 2) some aspects might be elaborated upon more in the discussion to get some in depth interpretation.

Re: Authors would like to thank the Reviewer for these encouraging comments and constructive proposals that have helped us to substantially improve the manuscript.

General:

Use of decimal point "1.5" versus "1·5".

Please add the full name to the abbreviations for example as footnote to the tables.
Typo mistake in the table, e.g., "Appropriate".

Re: According to this comment all decimal points have been changed, and all typos have been corrected to the best of our ability.

Abstract

The aims of the review are two-fold; however, in the abstract, aim 2 "to what extent do these effects of confinement increase social inequalities in child health" seem to be missing?

Re: We agree with the Reviewer that the abstract did not express clearly the objectives. The revised version has been modified as follows (see the abstract of the revised version):

~~"The COVID-19 pandemic has had indirect effects on children and young people due to school closures and lockdown. In the context of containment measures against the COVID-19 pandemic, our aims, the aims were to examine the impact of large scale lockdown and school closures measures to combat COVID-19 on child and adolescent health and well-being, and social inequalities in health."~~

Introduction

Page 2 line 21-27: Not clear what the main point of this paragraph is? Some details might help. For example the statement "for some children the impact will be lifelong", what is meant here? Is access vs no access meant in a broader sense? You can have access but live in a crowded home not being able to concentrate on virtual lessons? "Moreover, schools have an influence on every student's health, and have opportunities to advocate for implementation of reforms and innovations in school systems to promote the health of all students, and the linkage between health and education." This sentence is not clear. Suggest rewrite this paragraph to convey main point. Line 22: twice 'further'.

Re: We have revised these sentences for clarity (see page 4, paragraph 3 in the revised version):

~~"This pandemic is a universal crisis that has affected all population groups across the globe. and, for some children the impact will be lifelong, in particularly the most vulnerable groups and those with less economic, educational and social resources.⁶ Further, in response to school closures and depending on settings, many have opted for virtual online teaching further accentuating the existing digital divides between those who have access and those without access.⁷ Moreover, schools have health promotion potential by implementing diverse health interventions and opportunities to advocate for reforms and innovations to promote health of all students' health.⁸ have used schools as a platform, and have opportunities to advocate for implementation of reforms and innovations in school systems to promote the health of all students, and the linkage between health and education. Arguments over whether to close schools or not to prevent transmission during a pandemic need~~

to weigh in the potential health promotional benefits for children by attending school, in particular those in vulnerable situations. This disconnect needs to be addressed with closer cooperation that would revitalize not only their educational potential, but also child and adolescent health and wellbeing.^{40, 41}"

Page 2, line 37 and line 38: children were put at risk/ the risks are greater. Do the authors mean because of the inability to go to school? What are the risks being referred to.

Re: This sentence was based on the Editorial (see Ref 13 in the revised version) that mentions some of the measures taken by governments, specifically the UK gov in this case, and the potential negative influence mainly in vulnerable children. This Editorial approaches restriction measures taken as "social distancing measures". Children were not allowed to attend school with a few exceptions, they are allowed to only 'one form of exercise a day, for example, a run, walk, or cycle-alone or with members of your household'; and some other restrictions, just to reduce the impact of COVID-19 in adults. According to this comment the sentence has been modified to try to be more understandable, as follows (see page 4, 2nd to the last paragraph):

"In summary, during the fight against coronavirus in several countries, while adopting social distancing measures in order to reduce the spread of a disease that mainly causes direct harm to adults, children's needs have not been taken into due consideration ~~were being put at risk, in order to reduce the spread of a disease that mainly causes direct harm to adults.~~⁴²¹³"

Page 2, line 43: is- important.

Page 2 line 44: suggest to use 'given' instead of 'and the measures...'", Page 2, line 45: the aim states lockdown measures, but the question uses the wording large scale lockdown, is the focus only on large scale lockdowns and school closure? Suggest to give a clear 'definition' or description on what kind of situation is evaluated. It would help if consistent terms are used throughout the manuscript. How is lockdown defined, what is included in this review.

Re: According to this comment, sentences were revised for clarity. We analyzed lockdown independently on its extent and scope, rather we have analyzed restrictions as much as possible, without any limitations. According to this and other comments from the Reviewer and also following the proposal from the Editor-in-Chief, a Box with lockdown definition has been added. Moreover the "large scale" term has been deleted (see page 4, last paragraph):

"At the current stage of the pandemic we feel that it is important to summarize and compile existing information on the pandemic's impact on child health, and given the measures that have been taken. The aim of this rapid narrative review is therefore to study the impact of COVID-19 lockdown measures, and school closures on child and adolescent health and well-being. Our research questions were: a) What impact do large-

severe lockdowns and closure of schools have on child health and well-being?; and b) to what extent do these effects of confinement increase social inequalities in child health?"

Methods.

A rapid systematic review is used. Can the authors clarify what is meant with this type of review and/or provide a reference to the methodology they applied as 'rapid review'.

Page 3 line 10: which items cover which characteristics? Briefly describe.

Re: According to this comment and comments from other Reviewer and also the Associate Editor and the Editor in Chief we decided to exclude the word "rapid" from the title as well from the methods section. As a narrative review, some items such as sensitivity and subgroups analysis do not apply to the current study.

Page 3 line 18: "related to the measures adopted regarding of COVID-19". Was there a selection based on level of lockdown or were all studies included? What is the definition of lockdown used? I see at line 40 there is a specification on severity and time. Maybe it can be clear from the aims that all levels of lockdown are included. How is severity determined?

What is the difference in 'school closure and lockdown'? Or is there no difference.

Re: In accordance with these comments and the proposals of the Editor in Chief, a Box has been added with the definitions of school closure and confinement or lockdown (see the Box in the revised version regarding lockdown and school closure). Regarding severity and time, at the beginning we thought it would be possible to identify the specific exposures to lockdown, i.e., children confined at home and forbidden to go outside as was the case in Spain for 44 days is more severe than only school closure. However, it was not possible to identify and compare different exposures given that measures adopted were variable even within countries. Thus, the exposure measures finally assessed were school closure, lockdown, or both. This factor was also approached in the discussion section of limitations of our study. According to these comments the Data extraction section has been modified deleting the word severity (see page 5, last paragraph):

"Data extraction: **LR led data extraction that was checked by the rest of authors. Data extraction included a summary of findings trying to answer the research questions and characterize the included studies:** Author; setting (country: international, national or regional study); type of study; age(s); lockdown (~~severity and~~ time in days/months); school closure and lockdown (time period); type of outcome; impact on child health, and social inequalities."

And the inclusion criteria have been modified clarifying that any level of lockdown was included (see page 5, para 5):

"All quantitative studies **from** ~~in~~ peer review **literature** describing studies

that ~~include~~**provided** primary data about child (0-18 years) health and well-being, related to the measures **of school closure and any level of lockdown** adopted due to COVID-19 were included, **initially** without language restrictions.."

Results:

Page 4 line 12; is lockdown= confinement at home?

Re: As it was stated previously it was not possible to identify the severity of restrictions adopted in the case of children in all included studies. Nevertheless, we tried to specify as much as possible the nature of the restrictions in each included study (see Tables 1 to 5 in the revised version). The results have also been modified for clarity (see page 6, Exposure measure section):

"Exposure measures **(Box 1)**
School closure was the common measure adopted, although in most countries closure of schools and home confinement were both implemented at the same time; in some cases, the latter was established as a mandatory norm and especially for the child population, and in other cases it was established as a general recommendation. The impact of school closure and lockdown **or any measure of restriction such as stay-at-home, mandatory or as a recommendation**, was assessed between 2 weeks and 2-3 months after these measures were started."

Page 4, line 13: "was further stratified as low, intermediate or high risk", based on? A score or something else? Could you please indicate the criteria used?

Re: Stratification of the risk of bias was carried out just to facilitate decisions regarding inclusion/exclusion criteria based on the risk of bias. Then, when a specific study independently assessed by a pair of authors showed negative scores on items considered essentials in this specific study, it was excluded after discussion by consensus (see Supplementary material). The methods section has been modified as follow (see page 5, paragraph 4 in the revised version):

"and was further stratified as low, intermediate or high risk by consensus of each pair of authors. **In the first step the risk of bias of each study was independently assessed, and in the second step a consensus was achieved according to the number and characteristics of negative scores.**"

Page 4: if possible a paragraph on the second research question? Social inequalities The review included several studies on type 1 diabetes and these studies were grouped under the group "health service assess/use". Could this be a separate group (e.g., "chronic conditions") rather than care use?

Re: As stated in the discussion section a few of the studies addressed social determinants of child health and social inequalities. This aspect has been addressed in the discussion section in which we highlight the differences on the impact comparing studies from low vs high income countries (see the second para in the Discussion section).

According to this comment and also a proposal from the Editor-in-Chief the revised version includes 5 Tables of results, thereof one to address "diabetes mellitus" as proposed by the reviewer and the Editor-in-Chief (see the Results section in the revised version of the manuscript).

Discussion:

Page 5 line 47: "lockdown or confinement and closure". See previous comments on de description of included situations.

Re: We are of the opinion that previous comments and subsequent changes made to the sections have helped to clarify these concepts. Nevertheless, this sentence has been modified (see page 17, 2nd paragraph):

*"The results of this "non-natural experiment" are generalizable to most of the countries that applied **any level of lockdown or** confinement and closure of schools, although..."*

Page 5 paragraph 2: can anything be said about 1) lockdown severity or 2) differences between countries in regard to the effects on well-being observed?

Re: As it was stated previously, the level of lockdown severity was not possible to analyze separately in this study due to the lack of information and the variable application of measures adopted by the countries included in the study. The Discussion section have tried to approach this limitation. Moreover, according to this comment, a sentence has been added to this section regarding baseline differences in terms of education and health policy and redistribution policy and the potential influence on the results (see page 18, 1rst paragraph):

*"...Second, the exposure measures that we analyzed, both school closure and lockdown, varied between countries and also the period from the beginning of the measures and the time outcomes were assessed. This fact makes it difficult to ~~assesse~~**evaluate** the impact according to the level and duration of confinement and also to establish a clear association between exposure and outcomes. However, all the included studies present at least the timeline for ~~the initiation~~**g** of the measures adopted and ~~evaluation~~**g** of the results. **Third, educational, healthcare and redistributive policies before the pandemic conditioned each country's responses and results, and these factors must also be taken into account in future studies."***

Page 5 Line 49: "Confinement has produced an increase in previously existing inequalities with respect to access to basic living conditions and care services, with more difficulties in households with fewer resources." Is there a reference fort his statement?

Re: According to this comment, a reference has been added on the impact of the pandemic and confinement on health inequalities (see Ref number 40 in the revised version).

Page 6, line 26 and onwards: time periods of lockdown/ closure were different, can any remark/ discussion be made on this aspect? It is not in results nor discussion, at limitations it states that lockdown duration as well as study duration differed, in general terms.

Re: As it was stated previously it was not possible to separate/stratify the effect of different level of confinement given the study period, variability in the implemented measures by countries and within countries, etc. As the Reviewer points out, we have included this as one of the limitations of the study.

Around 75% of the studies on mental health and 100% of the studies on physical activities were carried out among adolescents. The effects of lockdown might vary by child age. Can some discussion be added with regard to the findings across ages?

Re: We agree with the Reviewer that most of included studies collect information on adolescent's mental health and physical activities. On the other hand, the rest of studies, such as child maltreatment, use of healthcare services, or type 1 DM include children with greater range of ages. A sentence has been added to the Discussion section as follow (see page 17, paragraph 4 in the revised version):

"The results show an impact on mental health and physical activity mainly in the adolescent population. However, it is likely that these factors have also had an impact on younger children, a fact that should be assessed in future studies."

Associate Editor

Comments to the Author:

Please see the comments from the reviewers

I am particularly concerned with the issue of the rapid review methodology- this is not a standardised method and is used - or abused - differently.

It can mean a fully systematic review, but done with a huge team with much resource very quickly - I did this with a team of 15 over 8 countries in 3 weeks for a COVID paper. But this does not appear to be what this paper did. Similarly, I was worried about short cuts, but there arent any definite cuts in methods. Can the authors clarify the underpinning source of the methods, how this was rapid, what short cuts if any were made?

Also, the synthesis is essentially meta-narrative but not well described in methods

This does need some work and the review needs to be clearer and I think more true to what it is, which does have value.

Re: Authors would like to thank the comments made by the Associate Editor that have helped to improve the manuscript. We agree with this comment in the sense that a rapid review is not a consensual standardized method and is broadly used. In our case (6 authors from 6 different countries) we have tried to complete a full search of peer reviewed quantitative studies as quickly as possible. The objective was to produce information

in a timely manner regarding a subject with important implications on child health given a critical moment; the pandemic was in the second wave, and several governments adopted once again restricting measures with the urgent need to have the most recent evidence available for political decision-making.

In any case, following this advice and also comments from the reviewers and the Editor-in-Chief, we have deleted the term "rapid review" from the title and the rest of the manuscript. Moreover, the methods section has been modified trying to include the whole process of selection of articles, inclusion/exclusion criteria, procedures, and analysis, according to this comment and following comments from Reviewer 1 (see the methods section of the revised version and the answers to the Reviewer 1).

I would also ask the authors to pay attention to conclusions and discussion to make sure they are fully supported by the data

Re: The Discussion section has been revised according to this comment and comments from the Reviewer 2 (see the Discussion section of the revised version). Conclusions were also modified in line with these comments (see the Conclusions on page 18 in the revised version):

"This **narrative** review attempt**ed**s to provide the best available evidence on the impact of **large-scale pandemic related** restrictive measures on child and adolescent health. **The findings call for the attention of decision-makers to take into account the risks and benefits for children's health, with respect to public health measures that are adopted** ~~These results urge acall to attention by of decision-makers regarding public health measures that are adopted and the need to apply the precautionary principle, taking into account the risks and benefits for children's health.~~"

I look forward to seeing a revision

Editor in Chief

Replace key messages section with What is already known and What this study adds sections. Your review is original research.

Re: Authors would like to thank the comments made by the Editor-in-Chief that have helped to improve the manuscript. The sections "What is already known" and "What this study adds" have been added as follow:

"What is already known

- **School closure and lockdown were measures initially adopted almost worldwide in the first wave to fight the COVID-19 pandemic**

- Lockdown and school closure have been shown to cause disproportionate impact on the most vulnerable populations
- Decisions on how to apply quarantine and school closures should be based on the best available evidence.

What this study adds

- The negative impact of school closures and lockdown has been felt by children across diverse geographies, involving high and low income settings
- Containment measures have produced a range of adverse effects including an increase in depressive symptoms, decrease in satisfaction with life, decrease in immunisation and an increase in unhealthy lifestyle
- Along with a decrease in emergency presentations, there was also a significant decrease in the number of child abuse and neglect allegations and child protection medical assessments
- The potential negative impacts on the health of children needs to be taken into account before adopting quarantine and school closures during a pandemic

Clarify your type of review. It appears to be a narrative review.

Re: The title of the revised version as well as the methods section have been modified according to this comment and also comments from the Reviewer 1 and the Associate Editor. The current title is: "Impact of lockdown and school closure on children's health and well-being during the first wave of COVID-19: a ~~rapid~~ narrative review" and we clarify better that our revised manuscript is a narrative review of quantitative peer reviewed studies. The methods section has been expanded to explain in more depth the process of selection, and analysis of data (see the methods section of the revised version as well as the answers to the Reviewer 1).

Happy for you to exceed word limit.

Re: Authors would like to thank for facilitating the extension. The revised version has 3086 words

Add a Box with definitions of lockdown and school closure

Re: According to this proposal a Box has been added as follow (see page 6 in the revised version):

"Box 1. Definitions of lockdown and school closure

- Although the term lockdown is not well-defined, it is used to nominate any measure adopted to contain the pandemic employing social distancing measures
- Lockdown measures range considerably, from mandatory total confinement in the home during prolonged periods to be only a recommendation to reduce social interactions and avoid non-essential work as much as possible
- School closure and online classes or home-schooling was the measure adopted in almost all cases during the first wave of the COVID-19 for primary and secondary schools in all included studies"

Supplementary Table 1 needs to be replaced with tables in the main text. Table 1 Mental health studies; table 2 physical activity/obesity studies; table 3 studies of diabetes mellitus; table 4 accessing healthcare (Tromans paper should really be in table 1 as it is focussed on mental health); table 5 child abuse studies Discussion 1st sentence delete "one of the first". The journal style is to avoid describing studies as the first, as this upto others to decide

Re: The revised version includes all the Tables recommended by the Editor-in-Chief included in the text. Moreover, article from Tromans et al. has been included in the mental health table (see the revised version of the manuscript).

VERSION 2 – REVIEW

REVIEWER	Reviewer name: Dr. Ansie Fouche Institution and Country: North West Univ, Social work, South Africa Competing interests: None
REVIEW RETURNED	27-Mar-2021

GENERAL COMMENTS	All my concerns were addressed. I don't have any further recommendations. Looking forward to see this article published.
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REVIEWER	Reviewer name: Dr. Caroline Jung-Sievers Institution and Country: Ludwig Maximilians Univ Munchen, United Kingdom of Great Britain and Northern Ireland Competing interests: None
REVIEW RETURNED	06-Apr-2021

GENERAL COMMENTS	<p>Dear authors,</p> <p>your manuscript on secondary effect of school closures on children's health and well-being addresses a very important topic that should be definitely put into account in future decisions. It is timely and interesting to read.</p> <p>Some aspects could be improved that address mainly the methodological rigor of the study:</p> <ul style="list-style-type: none"> -please provide a flow chart of the studies identified at initial stages that were then stepwise excluded at each step for reasons (such as a PRISMA flow chart) -please provide an exemplary search strategy for one of the mentioned databases
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	-the definition of the search outcome "secondary effects", "physical" and "mental" should deliver very wide and broad outcomes (such as an impact on education or social functioning etc). Since these outcomes are not directly excluded, one would expect some of these aspects in the results part.
REVIEWER	Reviewer name: Institution and Country: Competing interests:
REVIEW RETURNED	
GENERAL COMMENTS	

VERSION 2 – AUTHOR RESPONSE

Reviewer 1

All my concerns were addressed. I don't have any further recommendations. Looking forward to see this article published.

Re: Authors would like to thank the Reviewer for this encouraging comment.

Reviewer 2

You manuscript on secondary effect of school closures on children's health and well-being addresses a very important topic that should be definitely put into account in future decisions. It is timely and interesting to read.

Re: Authors would like to thank the reviewer for this comment.

Some aspects could be improved that address mainly the methodological rigor of the study:

-please provide a flow chart of the studies identified at initial stages that were then stepwise excluded at each step for reasons (such as a PRISMA flow chart)

Re: The PRISMA flow chart (**FIGURE 1 in the previous versions of the manuscript**) has been updated to include the suggested information about the exclusion reasons at the first stages (see the revised version of the **FIGURE 1**)

-please provide an exemplary search strategy for one of the mentioned databases

Re: We have tried to carry out a wider and broad search according to the characteristics and objectives of the present narrative review. The exemplary search (i.e. PubMed) strategy was stated as follow (see page 5 paragraph 1):

Search: "(Lockdown OR School closure) AND (COVID-19 OR SARS-CoV-2) AND (children OR adolescent) AND (secondary effects OR physical OR mental)" Filters: From 2019/12/1 to 2020/11/24.

-the definition of the search outcome "secondary effects", "physical" and "mental" should deliver very wide and broad outcomes (such as an impact on education or social functioning etc). Since

these outcomes are not directly excluded, one would expect some of these aspects in the results part.

Re: We agree with the Reviewer in the sense that we have tried to look at broad outcomes. In fact in the initial search 503 records were identified after duplicate exclusion. Nevertheless, it should be taken into account that we have included only quantitative studies from peer review literature, describing studies that provided primary data about child, and only original studies (cohort studies, repeated cross-sectional studies, etc., that means excluding cross-sectional studies carry out only during the pandemic). These inclusion criteria could be in part the reasons why studies mention by the Reviewer were not identified. Nevertheless, we have tried to comment on the impact on education and social functioning (see the Discussion section of the Manuscript and References 41 to 47).